Hotwire® ReachDSL® v1 (MVL®) Modem, Model 6310-A4, with Inline Phone Filter

Installation Instructions

Document Number 6310-A2-ZN12-10

December 2005

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Hotwire 6310 ReachDSL v1 (MVL) Modem Overview

The Hotwire® 6310 ReachDSL® version 1 (formerly MVL®) Modem is a component in the Hotwire ReachDSL System and interoperates with the Hotwire 8310 MVL, or Hotwire 8312/8314 ReachDSL Card in the DSLAM (Digital Subscriber Line Access Multiplexer) system. This system provides high-speed Internet or corporate LAN access over traditional twisted-pair copper telephone wiring.

The ReachDSL technology:

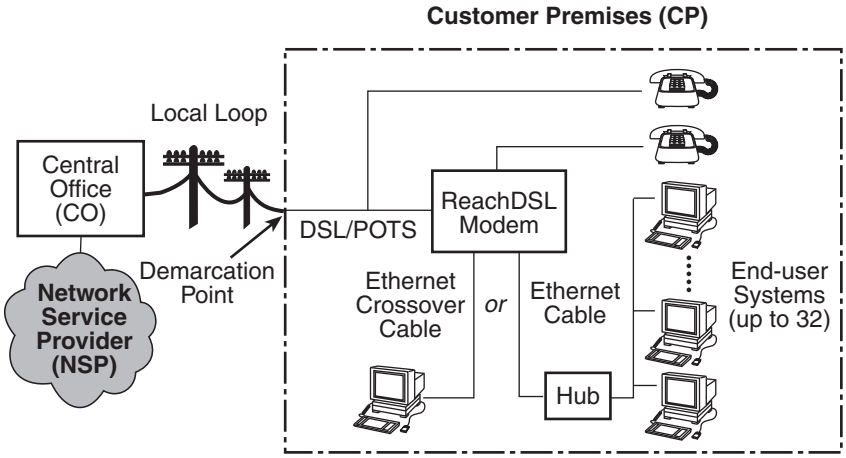
- Utilizes an inline phone filter on the ReachDSL modem's PHONE jack.
- Operates over existing copper wire with existing telephone jacks.
- Includes a second line pass-through from the ReachDSL modem's LINE jack to PHONE jack to accommodate an attached 2-line telephone.
- Provides rate adaptive data rates to dynamically adapt and allocate bandwidth to optimize applications.

In addition, the ReachDSL v1 technology:

- Transforms a single copper pair into multiple virtual lines to support multiple services simultaneously.
- Supports simultaneous multiple access of four ReachDSL v1 modems with up to 254 end-user systems sharing one common WAN interface.
- Features HomeLink, which provides peer-to-peer communications, including print and file sharing applications (see *HomeLink (for ReachDSL v1 Modems Only) on page 12*).

Hotwire ReachDSL System

Copper pairs run from the central office (CO) to the customer premises (CP) to create the local loop. The local loop terminates on the customer premises at the demarcation point.



DSL – Digital Subscriber Lines
POTS – Plain Old Telephone Service

NOTES:

In this document:

— A telephone is used to represent any equipment that plugs into a phone jack and uses the POTS line, such as a phone, modem, or fax machine.

— End-user system is used to represent any PC with an Ethernet connection and ReachDSL-based service.

— RJ11 wall jack is used to represent either an RJ11 or an RJ14 wall jack. The RJ14 wall jack is used for a phone with two lines.

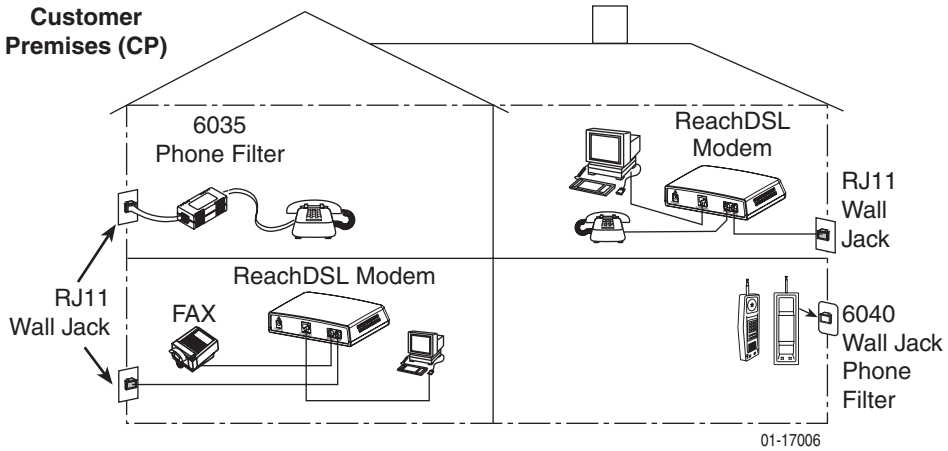
— Service provider is used to represent any Internet Service Provider (ISP) or remote LAN access provider.

Phone Filter

Depending on the type of phone handset and the quality of the home or business wiring, a phone filter is recommended to minimize background noise during a phone conversation. An internal phone filter is included with the Hotwire 6310 ReachDSL v1 Modem. If additional telephones are used on the same phone line as the ReachDSL modem, install one phone filter on each telephone.

There are two Hotwire phone filters:

- Hotwire 6035 Universal Phone Filter is designed for use with a tabletop phone.
- Hotwire 6040 Universal Wall Jack Phone Filter is designed for use with a wall phone.



Product-Related Documents

To install a phone filter, refer to the appropriate document:

- Hotwire 6035 Universal Phone Filter Installation Instructions
- Hotwire 6040 Universal Wall Jack Phone Filter Installation Instructions

Contact your sales or service representative to order additional product documentation.

Product documents are available on the World Wide Web at **www.zhone.com**.

Getting Started

Before beginning your modem's installation, make sure that you have all the equipment that you need.

Package Checklist

Verify that your package contains the following:

- Hotwire 6310 ReachDSL v1 Modem
- DSL interface cable with RJ11 connectors
- Power cord with power transformer

Wiring and Cables You Need

The following wiring and standard connectors are used with this product:

- Standard RJ11 (or RJ14) wall jack for the ReachDSL modem cabling.
- Standard Ethernet 8-pin, non-keyed modular plug for a PC or workstation. An Ethernet straight-through or crossover cable is used.
  - Refer to *Installing the Hotwire 6310 ReachDSL v1 Modem on page 7* for Ethernet installation details.
  - Refer to *Cables & Connectors on page 13* for ReachDSL modem and Ethernet cable pin assignments.

Installing the Hotwire 6310 ReachDSL v1 Modem

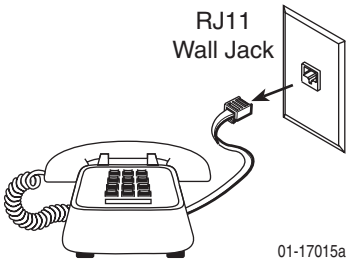
Place the ReachDSL modem on a flat surface with clearance for the rear connectors.

▶ Procedure

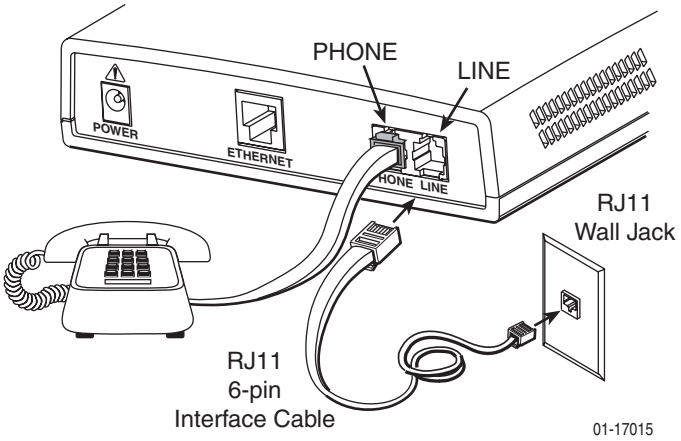
1 If a telephone is connected at the RJ11 wall jack where the modem will be installed, unplug the telephone line from the wall jack.

2 Connect a telephone to the modem. (Optional – go to Step 3 if you are not connecting a telephone to the ReachDSL modem.)

Plug the existing telephone interface cable that was unplugged in Step 1 into the jack labeled PHONE.



3 Use the supplied RJ11 6-pin interface cable for the LINE connection. Insert one end of the cable into the jack labeled LINE. Insert the other end of the cable into the RJ11 wall jack.

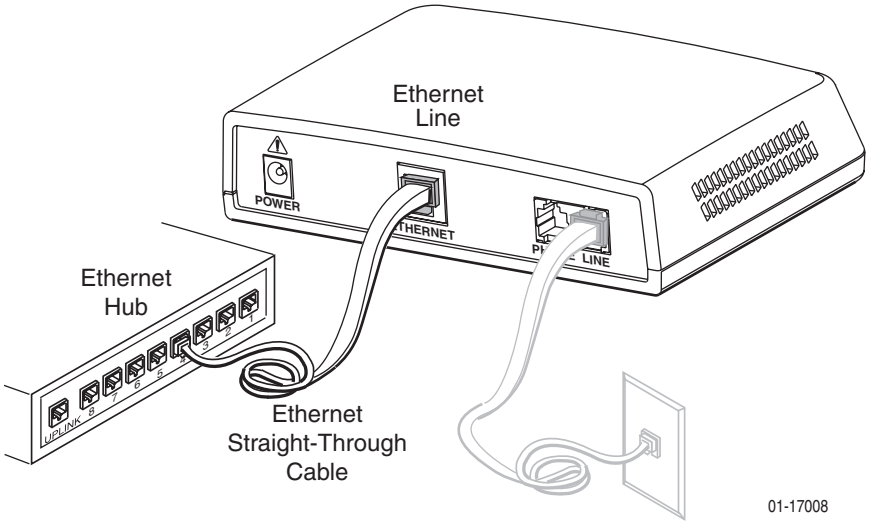


NOTE:

If you are installing a POTS splitter with another telephone, connect the telephone to the jack labeled PHONE, then connect the jack labeled LINE to a wall jack. Do NOT plug any cable into the POTS splitter jack labeled either MODEM or DSL. In particular, make NO connections between a POTS splitter and the modem.

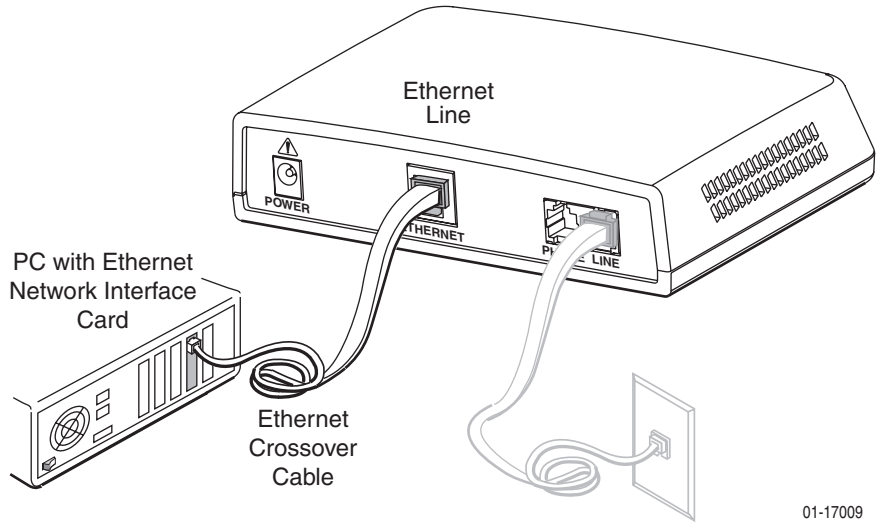
4 Use an 8-pin Ethernet cable for the Ethernet connection. Insert one end of the cable into the jack labeled ETHERNET.

— Use a straight-through cable and connect the other end to an Ethernet hub. (To connect to a hub's Uplink connection, use an Ethernet crossover cable).

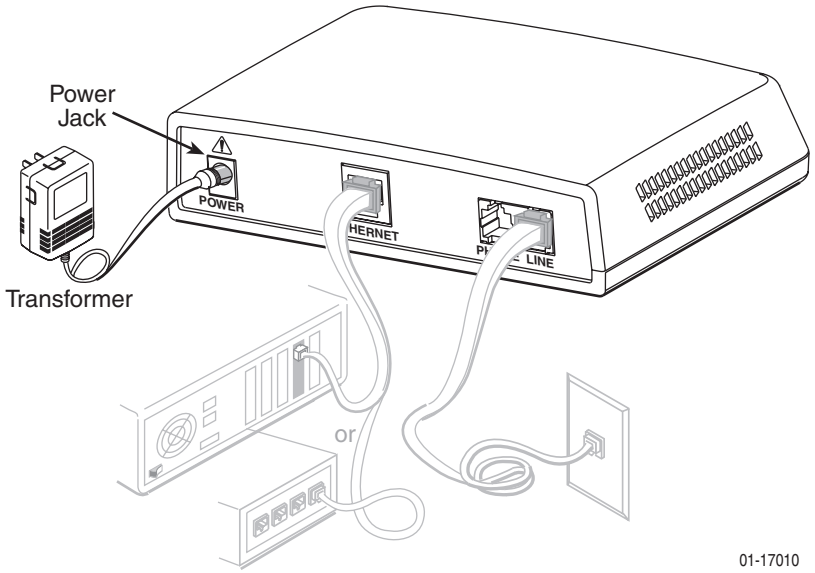


–or–

— Use an Ethernet crossover cable and connect the other end to a PC with an Ethernet Network Interface Card (NIC) installed.



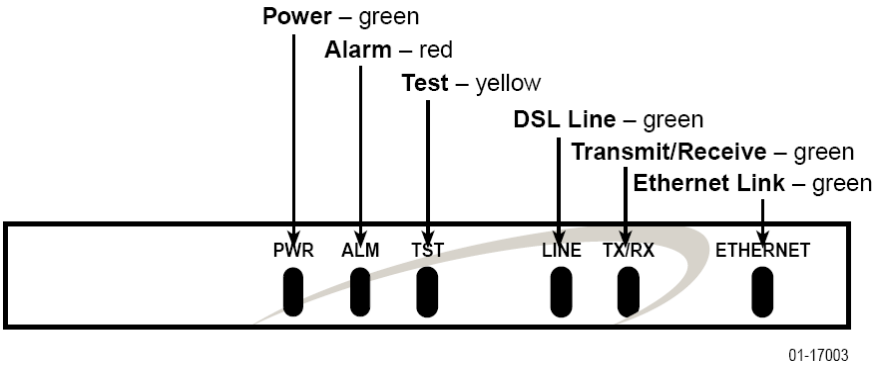
5 Insert the supplied power cord's round end into the jack labeled POWER. Plug the transformer into an AC outlet.



The ReachDSL modem hardware installation is now complete. When the power cord is installed, the ReachDSL modem goes through a power-on self-test.

Power-On

When power is applied, the ReachDSL modem performs self-diagnostics and the PWR LED is on. The self-diagnostics includes a power-on self-test and all of the LEDs turn on for one second.



Status LEDs

All of the LEDs turn on and off during the power-on self-test. After a successful self-test, the LEDs should appear as indicated in **BOLD** in the Condition column below.

LED	Condition	Status
PWR	**ON**	ReachDSL modem has power.
ALM	**OFF** ON	No active alarms. An alarm condition exists.
TST	**OFF** ON	No active tests. The TST LED is on during the power-on self-test and during a test initiated by the service provider.
LINE	**ON** OFF	The DSL link is active and ready to transmit and receive data. The DSL link has not been established.
TX/RX	**ON** OFF	Data transmission is in progress on the DSL line. The modem is not transmitting or receiving data.
ETHERNET	**ON** OFF	The Ethernet connection to the Ethernet hub or PC is active. No Ethernet 10BaseT device is detected.

Refer to *Troubleshooting on page 11* for LED indications requiring action.

Troubleshooting

LED Symptom	Action
All LEDs are on.	If LEDs remain on after ten minutes, the modem is not functional. Contact the service provider.
ALM LED remains on.	The power-on self-test may have failed. Unplug the unit and reapply power. If the alarm LED is still on, contact the service provider.
ALM and TST LEDs are blinking.	Firmware download may be in progress. If firmware download is not in progress or the LEDs continue blinking after ten minutes, contact the service provider.
Ethernet LED is off.	Verify that the Ethernet cable is securely installed at both ends, and at least one PC is connected and powered on.
	Verify that the correct straight-through or crossover cable is installed. Refer to *Installing the Hotwire 6310 ReachDSL v1 Modem on page 7*.
LINE LED is off.	Verify that the LINE cable is securely installed on both ends. If the problem continues, contact the service provider.
	Verify that the line has dial tone. If there is no dial tone, contact the service provider.
LINE LED is on and there is no data transmission.	The DSL link has been established but there is no data transmission. Verify the Ethernet connection. If the problem persists, contact the service provider.
LINE and Ethernet LEDs are on and there is no data transmission.	The DSL line and Ethernet links have been established but there is no data transmission. If the problem continues, contact the service provider.
PWR LED is off.	Check that the power cord is securely installed on both ends.
	If no LEDs are on, the power supply may be defective. Test the outlet to verify power. If the problem persists, contact the service provider.
	If other LEDs are on, the PWR LED may be burned out. Unplug the unit and reapply power; watch all LEDs during the power-on self-test to verify if the PWR LED is functioning.
TST LED is on.	A test initiated by the service provider may be active. Wait five minutes. If the TST LED does not go off, contact the service provider.

To improve data transmission throughput and minimize background noise during a telephone conversation, make sure that:

- The Hotwire 6310 ReachDSL v1 Modem is always powered on, even when not in use, and
- A Hotwire phone filter is installed on every telephone on the same line as the Hotwire 6310 ReachDSL v1 Modem (see *Phone Filter on page 5*).

HomeLink (for ReachDSL v1 Modems Only)

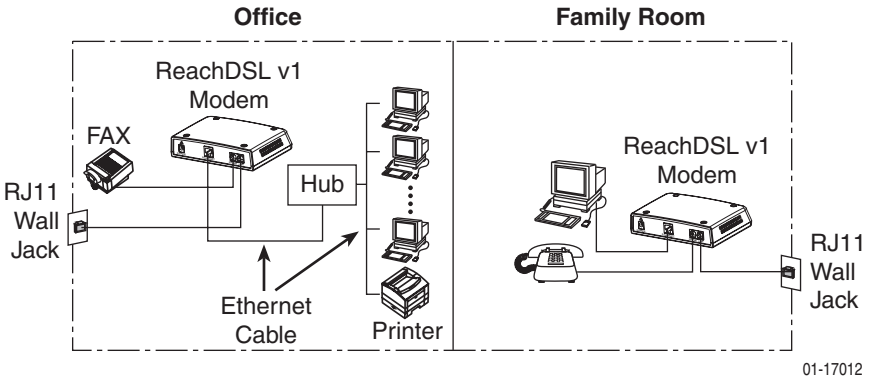
HomeLink is a feature that provides peer-to-peer communications for PCs attached to different Hotwire 6310 ReachDSL v1 modems at the customer premises.

For example, PCs that are not connected to the same physical Ethernet LAN can now take advantage of the resources of the primary office computer. With the Microsoft Windows operating system, multiple end-user systems can share resources, including:

- File sharing
- Print sharing
- Secondary computer backup

To enable the sharing of resources and review security considerations, see Microsoft's Web site at **www.microsoft.com**.

In this example of HomeLink, the PC in the family room could use the office printer.



Increasing the Number of End-User Systems

A single end-user system is attached to the Hotwire 6310 ReachDSL v1 Modem by using an Ethernet crossover cable. To increase the number of end-user systems, connect all the PCs to an Ethernet hub using a straight-through cable.

On one line, the ReachDSL v1 system provides the capability to use up to four Hotwire 6310 ReachDSL v1 modems and 32 end-user systems in any combination.

Cables & Connectors

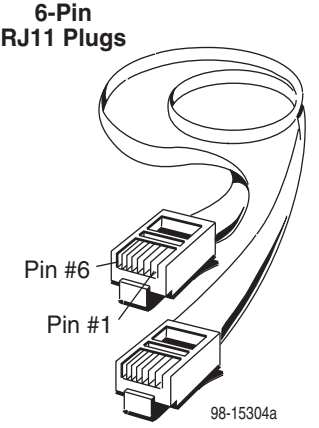
This section is reference information.

Standard twisted-pair CAT3 or better cables are recommended.

- The LINE and PHONE interface connectors use 6-pin, non-keyed modular plugs. RJ11 or RJ14 6-pin connectors can be used.

Line & Phone Connectors

Pin #	Function
1	Not used
2	Ring 2 (optional)
3	DSL Ring 1
4	DSL Tip 1
5	Tip 2 (optional)
6	Not used



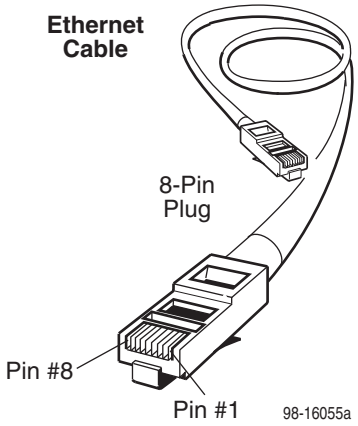
- The LINE and PHONE jack pinouts are either filtered or unfiltered for POTS.

PHONE Jack Pinouts		LINE Jack Pinouts	
Pin # 3, 4	Filtered for POTS	Pin # 3, 4	DSL and POTS
Pin # 2, 5	2nd POTS unfiltered	Pin # 2, 5	2nd line pass-through

- The Ethernet interface connector uses an 8-pin, non-keyed modular plug.
  - — To connect the ReachDSL modem to an Ethernet hub, use the straight-through connection.

8-Pin Straight-through Connection

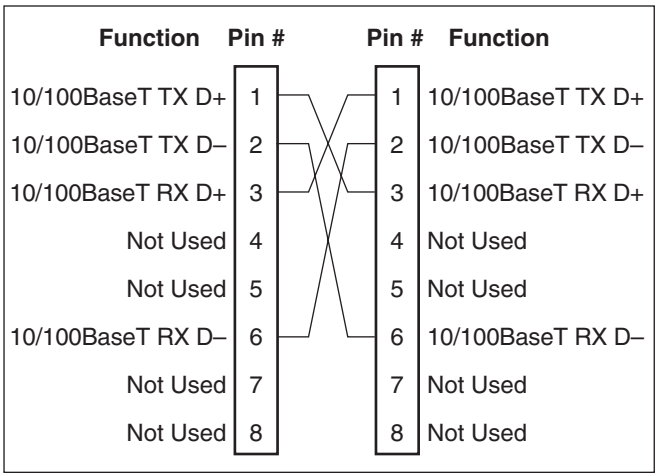
Pin #	Function
1	10BaseT TX D+
2	10BaseT TX D–
3	10BaseT RX D+
4 & 5	Not used
6	10BaseT RX D–
7 & 8	Not used



–or–

— To connect the ReachDSL modem directly to a PC with an Ethernet NIC card, use an Ethernet crossover cable.

8-Pin Ethernet Crossover Cable


Function
Pin #
Pin #
Function
10/100BaseT TX D+ 1 1 10/100BaseT TX D+
10/100BaseT TX D– 2 2 10/100BaseT TX D–
10/100BaseT RX D+ 3 3 10/100BaseT RX D+
Not Used 4 4 Not Used
Not Used 5 5 Not Used
10/100BaseT RX D– 6 6 10/100BaseT RX D–
Not Used 7 7 Not Used
Not Used 8 8 Not Used
99-16518

Pin #1/2 = Orange/White Twisted Pair

Pin #3/6 = Blue/White Twisted Pair

Optional ReachDSL Modem Wall Placement

The Hotwire 6310 ReachDSL v1 Modem is designed for tabletop placement. The ReachDSL modem can also be mounted on a wall. To mount the modem, you will need:

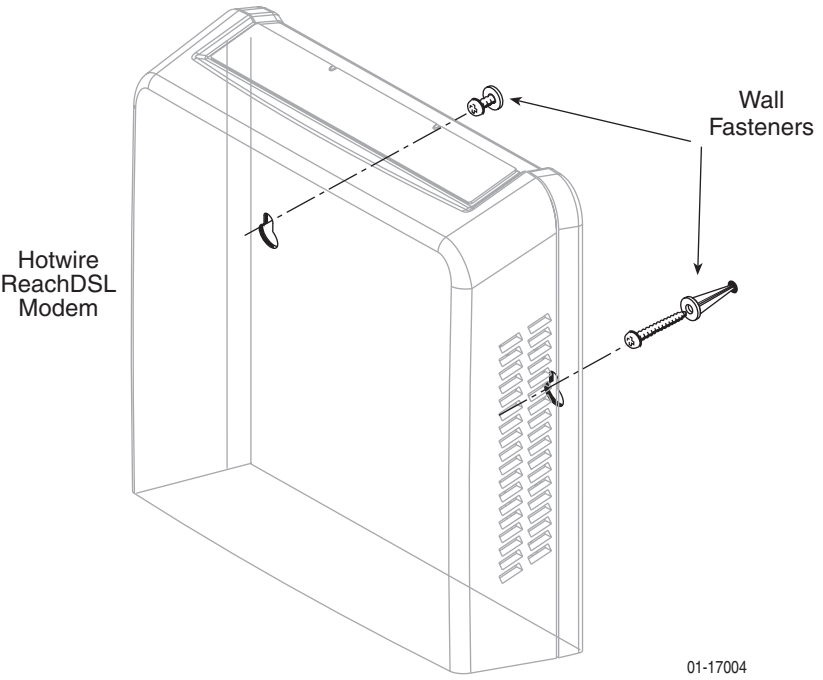
- q Two slotted-head #6 self-threading screws with plastic anchors
- q Drill and 3/16" drill bit for the plastic anchors
- q Screwdriver

A template with the dimensions for the two screws is provided. See *ReachDSL Modem Hardware Template on page 16*.

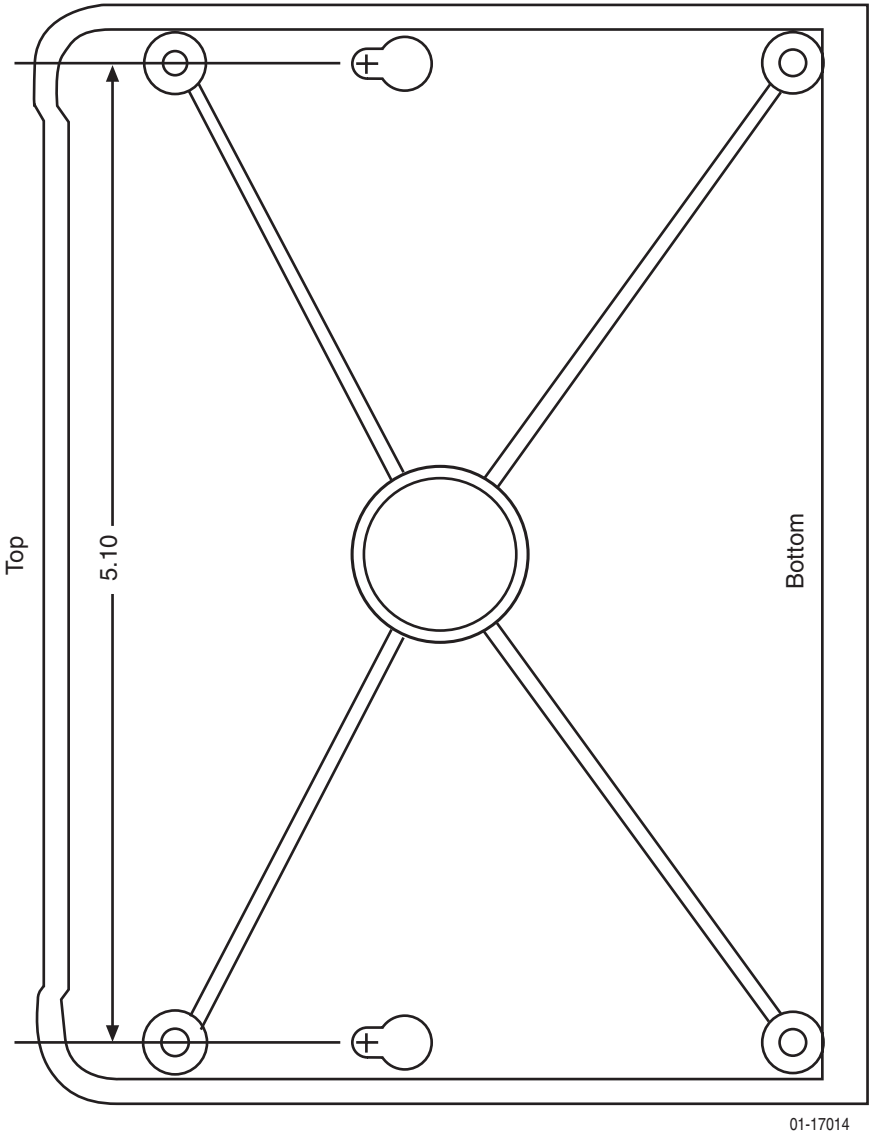
▶ Procedure

To mount the Hotwire 6310 ReachDSL v1 Modem:

1. Use a drill to install the plastic anchors.
2. Use a screwdriver to install the screws. Do not install the screws flush with the wall. Leave enough clearance to hang the modem housing from the screws.



ReachDSL Modem Hardware Template



Technical Specifications for Hotwire 6310 ReachDSL v1 Modem

Item	Specification*
Height x Width x Depth	1.46" x 5.72" x 4.33" (3.71 cm x 14.54 cm x 11.00 cm)
Weight	0.45 lb. (0.20 kg)
Power Class 2 Transformer normal service input voltage range	 Input: 100 VAC (±10%), 50 Hz; 120 VAC (±10%), 60 Hz; or 230 VAC (±10%), 50/60 Hz Output: 5 VDC nominal, minimum 0.6A (SELV)
Approvals FCC Part 15 CISPR 22 Other Certifications	 Class B digital device Class B Refer to equipment's label for approvals on product
Physical Environment Operating temperature Storage temperature Relative humidity Shock and vibration	 32°F to 104°F (0°C to 40°C) –22°F to 158°F (–30°C to 70°C) 5% to 95% (noncondensing) Withstands normal shipping and handling
Heat Dissipation	2.35 watts at 5.0 VDC (nominal input voltage)
Interface Connectors Line and Phone Interfaces Ethernet Type II Frame	 RJ11 or RJ14 6-pin 10BaseT 8-pin

* Technical Specifications subject to change without notification.

⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
3. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
4. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
5. General purpose cables are used with this product for connection to the network. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer. Use a UL Listed, CSA certified, minimum No. 24 AWG line cord for connection to the Digital Subscriber Line (DSL) network.
6. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
7. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.
8. Input power to this product must be provided by one of the following: (1) a UL Listed/CSA certified power source with a Class 2 or Limited Power Source (LPS) output for use in North America, or (2) a certified transformer, with a Safety Extra Low Voltage (SELV) output having a maximum of 240 VA available, for use in the country of installation.
9. In addition, since the equipment is to be used with telecommunications circuits, take the following precautions:
   - — Never install telephone wiring during a lightning storm.
   - — Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
   - — Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
   - — Use caution when installing or modifying telephone lines.
   - — Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
   - — Do not use the telephone to report a gas leak in the vicinity of the leak.

CE Marking

When the product is marked with the CE mark on the equipment label, this demonstrates full compliance with the following European Directives:

- **Directive 73/23/EEC** – Council Directive of 19 February 1973 on the harmonization of the laws of the member states relating to electrical equipment designed for use within states relating to electrical equipment designed for use within certain voltage limits, as amended by Directive 93/68/EEC.
- **Directive 89/336/EEC** – Council Directive of 3 May 1989 on the approximation of the laws of the member states relating to Electro-Magnetic Compatibility (EMC), as amended by Directive 93/68/EEC.

⚠ CANADA – EMI NOTICE:

This Class B digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du réglement sur le matérial brouilleur du Canada.

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取扱説明書に従って正しい取り扱いをして下さい。

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

Declaration of Conformity

This Declaration of Conformity is made by Zhone Technologies (formerly Paradyne Corporation) pursuant to Parts 2 and 15 of the Federal Communications Commission's Rules. This compliance information statement pertains to the following products:

Trade Name: Hotwire
Model Number: 6310-A4-200

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The name, address, and telephone number of the responsible party is given below:

Zhone Technologies
8545 126th Avenue North
Largo, FL 33773-1502
Phone: (727) 530-2000

The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Zhone Technologies, Inc.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Government Requirements

Certain governments require that instructions pertaining to connection to the telephone network be included in the installation and operation manual. Specific instructions are listed in the following sections.

United States – Notice to Users of the Telephone Network

1. This equipment complies with Part 68 of the FCC rules. On the equipment is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. The label is located on the bottom of your modem.
2. The Hotwire 6310 ReachDSL v1 Modem connects to the Public Switched Telephone Network (PSTN) using the Universal Service Order Code (USOC) RJ11C or RJ14C.
3. The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total RENs, contact the telephone company to determine the maximum RENs for the calling area.
4. If the modem causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
5. The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make the necessary modifications in order to maintain uninterrupted service.
6. If you experience trouble with this equipment, please contact your sales or service representative (as appropriate) for repair or warranty information. If the product needs to be returned to the company service center for repair, contact them directly for return instructions.

   If the trouble is causing harm to the telephone network, the telephone company may request that you remove the equipment from the network until the problem is resolved.
7. The user is not authorized to repair or modify the equipment.
8. This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line Service is subject to state tariffs. (Contact the state public utility commission, public service commission or corporation commission for information.)
9. An FCC compliant telephone cord with modular plugs may be provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack which is Part 68 compliant.

Notice to Users of the Canadian Telephone Network

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

> **CAUTION:**
>
> **Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.**

The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

If your equipment is in need of repair, refer to *Contacting Global Service and Support on page 23*.

Trademarks

Acculink, ADSL/R, Bitstorm, Comsphere, DSL the Easy Way, Etherloop, FrameSaver, GigMux, GranDSLAM, GrandVIEW, Hotwire, the Hotwire logo, iMarc, JetFusion, Jetstream, JetVision, MALC, MVL, NextEDGE, Net to Net Technologies, Paradyne, the Paradyne logo, Quick Channel, Raptor, ReachDSL, SLMS, StormPort, TruePut, Z-Edge, Zhone, ZMS, and the Zhone logo are trademarks owned by Zhone Technologies, Inc., which may be registered in some jurisdictions.

Patent Notification

Hotwire MVL products are protected by U.S. Patents: 4,669,090, 4,744,092, 5,291,521, 5,805,669, and 5,848,150. Other U.S. and foreign patents pending.

Contacting Global Service and Support

Contact Global Service and Support (GSS) if you have any questions about this or other Zhone products. Before contacting GSS, make sure you have the following information:

- Zhone product you are using
- System configuration
- Software version running on the system
- Description of the issue

Technical Support

If you require assistance with the installation or operation of your product, or if you want to return a product for repair under warranty, contact GSS. The contact information is as follows:

E-mail	support@zhone.com
Telephone (North America)	877-ZHONE20
Telephone (International)	510-777-7133
Internet	www.zhone.com/support

If you purchased the product from an authorized dealer, distributor, Value Added Reseller (VAR), or third party, contact that supplier for technical assistance and warranty support.

Service Requirements

If the product malfunctions, all repairs must be performed by the manufacturer or a Zhone-authorized agent. It is the responsibility of users requiring service to report the need for service to GSS.

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